UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/575,651	04/14/2006	Richard M. Miller	GB 030191	1825

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

	Application No.	Applicant(s)
Office Action Summary	10/575,651	MILLER ET AL.
	Examiner	Art Unit	
	Chat C. Do	2193	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>14 April 2006</u>.
2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>1-38</u> is/are pending in the application.
    4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) <u>1-38</u> is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☒ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on <u>04/14/2006</u> is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a) ☐ All   b) ☐ Some * c) ☒ None of:
      1. ☒ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____.
      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

1.   Acknowledgment is made of applicant's claim for foreign priority based on an application

filed in United Kingdom on 10/18/2003. It is noted, however, that applicant has not filed a

certified copy of the No. 0324369.8 application as required by 35 U.S.C. 119(b).

Specification

2.   Applicant is reminded of the proper language and format for an abstract of the disclosure.

        The abstract should be in narrative form and generally limited to a single paragraph on a
separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed
150 words in length since the space provided for the abstract on the computer tape used by the
printer is limited. The form and legal phraseology often used in patent claims, such as "means"
and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist
readers in deciding whether there is a need for consulting the full patent text for details.

        The language should be clear and concise and should not repeat information given in the
title. It should avoid using phrases which can be implied, such as, "The disclosure concerns,"
"The disclosure defined by this invention," "The disclosure describes," etc.

3.   The abstract of the disclosure is objected to because the abstract should be on a separate

sheet. Correction is required. See MPEP § 608.01(b).

        The following guidelines illustrate the preferred layout for the specification of a utility
application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

        As provided in 37 CFR 1.77(b), the specification of a utility application should include
the following sections in order. Each of the lettered items should appear in upper case, without
underlining or bold type, as a section heading. If no text follows the section heading, the phrase
"Not Applicable" should follow the section heading:

(a) TITLE OF THE INVENTION.
(b) CROSS-REFERENCE TO RELATED APPLICATIONS.
(c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR
     DEVELOPMENT.
(d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
(e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A
     COMPACT DISC.
(f) BACKGROUND OF THE INVENTION.
     (1) Field of the Invention.
     (2) Description of Related Art including information disclosed under 37 CFR 1.97
     and 1.98.
(g) BRIEF SUMMARY OF THE INVENTION.
(h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
(i) DETAILED DESCRIPTION OF THE INVENTION.
(j) CLAIM OR CLAIMS (commencing on a separate sheet).
(k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
(l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence
     Listing" is required on paper if the application discloses a nucleotide or amino
     acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence
     Listing" is not submitted as an electronic document on compact disc).

4.   The disclosure is objected to because of the following informalities: the specification is

not written in the above format wherein all the header sections are missing which distinctively

identify individual sections.

     Appropriate correction is required.

Claim Objections

5.   Claims 1-38 are objected to because of the following informalities:

     Re claims, most of these claims including references which advised to be

removed.

     Re claim 37, it should depend on claim 36 instead of claim 26 for similarly seen

in claim 18.

     Appropriate correction is required.

Claim Rejections - 35 USC § 112

6.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7.   Claims 1-38 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Re claim 1, the method is directing to a IDCT but it is unclear which step(s) within the claim would perform the IDCT as suggested in the preamble. Claim 20 has similar rejection.

Re claim 18, the limitations "the first three groups" lack of an antecedence basis and unclear as what is the first three groups. Claim 37 has similar rejection.

Thus, claims 2-17, 19, 21-36 and 38 are also rejected for being dependent on the rejected base claims 1 and 20 respectively.

Claim Rejections - 35 USC § 101

8.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

9.   Claims 1-38 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 1-38 cite a method and apparatus for calculating an IDCT in accordance

with a mathematical algorithm. However, the method claims 1-19 fail to tie to any

specific machine or apparatus for realizing the implementation. The apparatus claims 20-

38 fail to address any specific hardware structure for realizing the implementation

wherein all the means for can be realized by software modules. Therefore, claims 1-38

are directed to non-statutory subject matter.

Claim Rejections - 35 USC § 103

10.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

11.   Claims 1-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Singh et al.

(U.S. 2002/0027954) in view of Kim (U.S. 6,456,663).

Re claim 1, Singh et al. disclose in Figures 1-5 a method of calculating an inverse

transform for transform coded data (200) (e.g. abstract and any Figures 1-3 with the

IDCT processor), said coded data being arranged in groups of coefficients (202,204,206)

(e.g. Figure 4 and setting in paragraphs [0031 and 0033]), wherein the inverse transform

is performed selectively so as to apply abbreviated processing to groups composed

entirely of zero-valued coefficients (204) (e.g. any optimal IDCT in Figures 1-3 and

paragraph [0089]), and wherein, for the purpose of selecting whether abbreviated

processing is to be applied, a data group (206) is considered a zero-valued group if the

only non-zero coefficient contained therein is a coefficient modified for mismatch control

(e.g. paragraphs [0085-0089]).

Singh et al. fail to disclose at least one coefficient is selectively modified to

control mismatch. However, Kim discloses in Figure 2 at least one coefficient is

selectively modified to control mismatch (e.g. by the IDCT mismatch control 33 in

Figure 2).

Therefore, it would have been obvious to a person having ordinary skill in the art

at the time the invention is made to add at least one coefficient is selectively modified to

control mismatch as seen in Kim's invention into Singh et al.'s invention because it

would enable to reduce the error (e.g. col. 2 lines 43-63).

Re claim 2, Singh et al. further disclose in Figures 1-5 transform coded data is

discrete cosine transform coded data (e.g. abstract and any Figures 1-3).

Re claim 3, Singh et al. further disclose in Figures 1-5 discrete cosine transform

coded data forms part of MPEG-1 or MPEG-2 encoded video data (e.g. paragraph

[0004]).

Re claim 4, Singh et al. further disclose in Figures 1-5 the data is arranged in a

two-dimensional array (e.g. Figures 4-5).

Re claim 5, Singh et al. further disclose in Figures 1-5 two-dimensional array is

an 8.times.8 array (e.g. Figures 4-5).

Re claim 6, Singh et al. further disclose in Figures 1-5 a two-pass approach of

multiple 1-D inverse transforms is applied (e.g. paragraph [0037]).

Re claim 7, Singh et al. further disclose in Figures 1-5 each data group (202,204,206) is a column or a row of said array, depending on whether vertical inverse transform or horizontal inverse transform is performed first (e.g. paragraphs [0074-0087]).

Re claim 8, Singh et al. further disclose in Figures 1-5 the second pass inverse transform routine is made on the basis of the combinations of non-zero valued groups (202) (e.g. paragraph [0089]).

Re claim 9, Singh et al. further disclose in Figures 1-5 a number of variations of a second pass process executable code are pre-stored, each variation corresponding to a combination of non-zero groups (202) present in the first pass, the code determining on which coefficients calculation is performed (e.g. Figure 2 with the algorithm store 18 and paragraph [0089]).

Re claim 10, Singh et al. further disclose in Figures 1-5 the second pass code is adapted to ignore data from unprocessed input groups (e.g. paragraph [0089]).

Re claim 11, Singh et al. further disclose in Figures 1-5 a direct 2-D implementation is used (e.g. any Figures 1-3).

Re claim 12, Singh et al. further disclose in Figures 1-5 the groups assumed zero are 2-D blocks of coefficients (e.g. Figures 1-3).

Re claim 13, Singh et al. further disclose in Figures 1-5 the coefficient modified for mismatch control is the last coefficient (e.g. paragraph [0085]).

Re claim 14, Singh et al. further disclose in Figures 1-5 an inverse transform of the data group containing the coefficient modified for mismatch control is pre-calculated and used in calculating the inverse transform (e.g. paragraph [0085]).

Re claim 15, Singh et al. further disclose in Figures 1-5 the inverse transform for each data group is calculated only for data groups (202) for which, discounting any mismatch modification (e.g. paragraphs [0034 and 0085]), there is a non-zero coefficient and wherein, if mismatch is indicated, pre-calculated output values are used for the data group (206) having the modified coefficient (e.g. paragraphs [0085-0089]).

Re claim 16, Singh et al. further disclose in Figures 1-5 the number of non-zero data groups (202) and each of their positions is determined before performing the inverse transform for any of the groups and a routine is selected from a number of possible routines (e.g. Figures 4-5), depending on the configuration of non-zero groups (202) and their positions (e.g. any of Figures 1-3).

Re claim 17, Singh et al. further disclose in Figures 1-5 there is at least one non-zero group (202) outside a subset of said groups, the inverse transform is calculated for all groups (202,204,206) (e.g. paragraphs [0031-0033]); and where there are no non-zero groups (202) outside said subset, then the inverse transform is calculated for said subset and not for the remaining groups (e.g. paragraph [0089]), and, if the modified coefficient is non-zero, pre-calculated values are used to reproduce the effect of the modified coefficient ([7,7]) in the inverse transform (e.g. paragraph [0085]).

Re claim 18, Singh et al. further disclose in Figures 1-5 subset comprises the first three groups (e.g. paragraphs [0031-0033] and Figures 1-3).

Re claim 19, Singh et al. further disclose in Figures 1-5 routines are further optimized such that: where the only non-zero data groups (202) is the first group, the inverse transform is calculated in two dimensions for the non-zero data group (202) only, and if the modified coefficient is non-zero, pre-calculated values of the effect the modified coefficient has on each output value are then added (e.g. Figures 1-3, paragraphs [0031-0033 and 0085-0089]); and/or if only the DC coefficient (420) is non-zero, all output values are set to the value of the DC coefficient and if the modified coefficient is non-zero, pre-calculated values of the effect the modified coefficient has on each output value are then added.

Re claim 20, it is an apparatus claim having similar limitations cited in claim 1. Thus, claim 20 is also rejected under the same rationale as cited in the rejection of rejected base claim 1.

Re claim 21, it is an apparatus claim having similar limitations cited in claim 2. Thus, claim 21 is also rejected under the same rationale as cited in the rejection of rejected base claim 2.

Re claim 22, it is an apparatus claim having similar limitations cited in claim 3. Thus, claim 22 is also rejected under the same rationale as cited in the rejection of rejected base claim 3.

Re claim 23, it is an apparatus claim having similar limitations cited in claim 4. Thus, claim 23 is also rejected under the same rationale as cited in the rejection of rejected base claim 4.

Re claim 24, it is an apparatus claim having similar limitations cited in claim 5. Thus, claim 24 is also rejected under the same rationale as cited in the rejection of rejected base claim 5.

Re claim 25, it is an apparatus claim having similar limitations cited in claim 6. Thus, claim 25 is also rejected under the same rationale as cited in the rejection of rejected base claim 6.

Re claim 26, it is an apparatus claim having similar limitations cited in claim 7. Thus, claim 26 is also rejected under the same rationale as cited in the rejection of rejected base claim 7.

Re claim 27, it is an apparatus claim having similar limitations cited in claim 8. Thus, claim 27 is also rejected under the same rationale as cited in the rejection of rejected base claim 8.

Re claim 28, it is an apparatus claim having similar limitations cited in claim 9. Thus, claim 28 is also rejected under the same rationale as cited in the rejection of rejected base claim 9.

Re claim 29, it is an apparatus claim having similar limitations cited in claim 10. Thus, claim 29 is also rejected under the same rationale as cited in the rejection of rejected base claim 10.

Re claim 30, it is an apparatus claim having similar limitations cited in claim 11. Thus, claim 30 is also rejected under the same rationale as cited in the rejection of rejected base claim 11.

Re claim 31, it is an apparatus claim having similar limitations cited in claim 12. Thus, claim 31 is also rejected under the same rationale as cited in the rejection of rejected base claim 12.

Re claim 32, it is an apparatus claim having similar limitations cited in claim 13. Thus, claim 32 is also rejected under the same rationale as cited in the rejection of rejected base claim 13.

Re claim 33, it is an apparatus claim having similar limitations cited in claim 14. Thus, claim 33 is also rejected under the same rationale as cited in the rejection of rejected base claim 14.

Re claim 34, it is an apparatus claim having similar limitations cited in claim 15. Thus, claim 34 is also rejected under the same rationale as cited in the rejection of rejected base claim 15.

Re claim 35, it is an apparatus claim having similar limitations cited in claim 16. Thus, claim 35 is also rejected under the same rationale as cited in the rejection of rejected base claim 16.

Re claim 36, it is an apparatus claim having similar limitations cited in claim 17. Thus, claim 36 is also rejected under the same rationale as cited in the rejection of rejected base claim 17.

Re claim 37, it is an apparatus claim having similar limitations cited in claim 18. Thus, claim 37 is also rejected under the same rationale as cited in the rejection of rejected base claim 18.

Re claim 38, it is an apparatus claim having similar limitations cited in claim 1. Thus, claim 38 is also rejected under the same rationale as cited in the rejection of rejected base claim 19.

Conclusion

12.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

    a.   U.S. Patent No. 6,327,602 to Kim discloses an IDCT in an MPEG decoder.

    b.   U.S. Patent No. 2002/0161809 to Lan et al. disclose a reduced complexity IDCT decoding with graceful degradation.

    c.   U.S. Patent No. 6,421,695 to Bae et al. disclose an apparatus for implementing IDCT in digital image processing system.

    d.   U.S. Patent No. 6,167,092 to Lengwehasatit discloses a method and device for variable complexity decoding of motion compensated block-based compressed digital video.

    e.   U.S. Patent No. 7,587,093 to Lee discloses a method and apparatus for implementing DCT/IDCT based video/image processing.

    f.   U.S. Patent No. 6,799,192 to Handley discloses a method and apparatus for IDCT.

    g.   U.S. Patent No. 6,456,663 to Kim disclose a DCT domain down conversion system that compensates for IDCT mismatch.

    h.   U.S. Patent No. 5,387,982 to Kitaura et al. disclose an apparatus for performing IDCT.

i.   U.S. Patent No. 6,775,414 to Fogg et al. disclose a variable-length code decoder.

j.   E.P. Patent No. 1,143,738 to Kim discloses a DCT domain down conversion

system that compensates for IDCT mismatch.

k.   U.S. Patent No. 2002/0163967 to Youn et al. disclose a transcoding apparatus and

method.

l.   U.S. Patent No. 2002/0027954 to Singh et al. disclose a method and device for

gathering block statistics during inverse quantization and iscan.

m.   U.S. Patent No. 6,721,362 to Lin et al. disclose a constrained DCT coefficients for

better error detection in a corrupted MPEG-4 bitstreams.

n.   U.S. Patent No. 6,650,707 to Youn et al. disuclose a transcoding apparatus and

method.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to CHAT C. DO whose telephone number is (571)272-3721. The

examiner can normally be reached on Tue-Fri 9:00AM to 7:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Lewis Bullock can be reached on (571) 272-3759. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would

like assistance from a USPTO Customer Service Representative or access to the automated

information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Chat C. Do/
Primary Examiner, Art Unit 2193

November 12, 2009